TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY PERMIT No. 76632

I. INTRODUCTION

This Class II operating permit is for the construction and operation of Technocon International DBA Alliance Metals Southwest LLC's Alliance Metals Aluminum Manufacturing Facility located in La Paz County.

A. Company Information

Facility Name:	Technocon International DBA Alliance Metals Southwest LLC
Mailing Address:	70050 US 60 Wenden, AZ 85357
Facility Location:	70050 US 60 Wenden, AZ 85357

B. Attainment Classification

Alliance Metals Aluminum Manufacturing Facility is located in an area which is in attainment or unclassified for all criteria pollutants.

II. PROCESS DESCRIPTION

A. Process Description

Scrap aluminum enters the facility via trucks and is loaded onto a receiving bay. A front end loader will be used to move the scrap from the receiving bay to a feed hopper. The hopper loads the scrap into a series of crushers and a screen. The crushed aluminum scrap is sent through an x-ray machine to analyze the material and identify alloys that cannot be processed. Material that cannot be processed will be stored inside a sea container next to the crusher building or inside the crusher building until it is sold and shipped off site.

Once the waste material has been removed, scrap aluminum is melted in the rotary furnace. Vaporized chlorine is injected into the molten aluminum to remove magnesium impurities in the form of a salt cake. The resulting salt cake can be sold as a byproduct of the facility or be washed by an external source and reintroduced as a fluxing agent into the rotary furnace. The salt cake will be stored inside the furnace building until it is shipped off site to customers. The molten aluminum is then sent to a holding furnace, which pours the molten aluminum into ingots and T bars.

B. Control Devices

The facility uses the following air pollution control equipment to minimize emissions from the secondary aluminum processing units:

1. A baghouse is utilized to remove particulate matter emissions from the holding and rotary furnaces.

2. Lime is injected into the fabric filters to control emissions of hydrogen chloride from the holding and rotary furnaces.

III. LEARNING SITE EVALUATION

In accordance with ADEQ's Environmental Permits and Approvals near Learning Sites Policy, the Department is required to conduct an evaluation to determine if any nearby learning sites would be adversely impacted by the facility. Learning sites consist of all existing public schools, charter schools and private schools the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ.

Upon review of ADEQ's database, it was determined that there is one learning site within 2 miles of the facility. As documented in Section IX, air dispersion modeling analysis has shown that the facility's operation will not adversely affect the learning site.

IV. EMISSIONS

The facility has a potential-to-emit (PTE) more than the permitting exemption threshold for particulate matter less than 10 microns (PM_{10}). The facility's PTE is provided in Table-1 below:

Table 1: Potential to Emit

Pollutant	Emissions (tons per year)	Permitting Exemption Threshold	Minor NSR Triggered?
NO_x	6.4	20	No
PM_{10}	9.9	7.5	Yes
$PM_{2.5}$	1.6	5	No
CO	10.8	50	No
SO_2	0.08	20	No
VOC	0.7	20	No
Pb	0.00006	0.3	No
D/F	1.31E-06	-	N/A
HCl	1.75	-	N/A
HAPs (total – including HCl and D/F emissions)	3.2	-	N/A

V. MINOR NSR REVIEW

The potential to emit for PM_{10} is greater than the permitting exemption threshold of 7.5 tons per year. Thus, the facility is subject to minor NSR (New Source Review) requirements. The facility has opted to comply with the minor NSR requirements by performing a Reasonably Available Control Technology (RACT) analysis instead of conducting an ambient air quality assessment. RACT is required for new or modified sources to ensure compliance with the National Ambient Air Quality Standards (NAAQS). RACT takes into account the social, environmental, energy and economic impact of the controls as well as the control technology used at similar sources. Since

the Alliance Metals Aluminum Manufacturing Facility is a new source and has emissions that exceed 20% of minor NSR threshold, RACT is required for those pollutants.

In addition to RACT, the Arizona Department of Environmental Quality (ADEQ) has performed modeling analysis to ensure compliance with the NAAQS. The results of this modeling can be found in Section IX.

Emissions of PM_{10} and $PM_{2.5}$ from the holding and rotary furnaces will be controlled using a baghouse. The furnaces utilize natural gas as fuel, which is considered Best Available Control Technology (BACT) for emissions of carbon monoxide according to the RACT/BACT/LAER Clearinghouse (RBLC). The furnaces will also utilize low NO_X burners to control emissions of nitrogen oxides from the fuel combustion.

VI. APPLICABLE REGULATIONS

Alliance Metals Aluminum Manufacturing Facility is considered an area source under the federal requirements for Subpart RRR of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for secondary aluminum production facilities.

Aluminum recycling facilities process aluminum scrap that is identified as "clean charge" or "*not clean charge*." Clean charge is aluminum scrap that has been processed to be entirely free of paints, coatings, and lubricants. *Not clean charge* is classified as anodized aluminum that contains dyes or sealants containing organic compounds. The type of charge used in the process is important to determine what type of classification the furnace falls under the federal rules.

There are two classifications of furnaces under the federal rules; group 1 and group 2. Group 1 furnaces are defined as furnaces that melt, hold, or process aluminum that is *not clean charge*, with or without reactive fluxing, or furnaces that processes clean charge with reactive fluxing. Reactive fluxing is the use of any gas, liquid, or solid flux that results in a HAP (hazardous air pollutant) emission. HAP emissions from group 1 furnaces include dioxins and furans (D/F) from processing *not clean charge* and hydrogen chloride (HCl) if using chlorine as a reactive flux.

Group 2 furnaces melt, hold, or process clean charge and perform no fluxing or perform fluxing using only nonreactive, non-HAP-containing/non-HAP-generating gases or agents, such as argon or nitrogen.

Alliance Metals Aluminum Manufacturing Facility processes aluminum scrap that is *not clean charge* and uses vaporized chlorine as a reactive flux. Therefore, the facility is subject to requirements for group 1 furnaces under Subpart RRR for the rotary and holding furnaces. The federal rule does not regulate emissions of particulate matter (PM) and HCl for area sources, however, the facility will control emissions of these pollutants using a baghouse with lime injected fabric filters. These pollution control devices have monitoring and operation requirements under the federal rule.

Emissions of D/F are regulated under Subpart RRR for both major and area sources. An initial performance test is required for D/F to ensure compliance with the emission limitations in Subpart RRR. ADEQ has implemented additional performance test requirements under state rules to ensure the limit is being continually met.

Table 2 identifies applicable regulations and verification as to why that standard applies.

Table 2: Applicable Regulations

Unit & year	Control Device	Rule	Discussion
Secondary Aluminum Processing Equipment (2019)	Baghouse, lime injected fabric filters	40 CFR 63 Subpart RRR	These standards are applicable to all secondary processing equipment at the facility.
Chlorine Storage Tank, Chlorine Vaporizer and Lime Hopper	None	A.A.C. R18-2-730	These standards are applicable to unclassified sources.
Fugitive dust sources	Water Trucks Dust Suppressants	A.A.C. R18-2 Article 6 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources at the facility.
Abrasive Blasting	Wet blasting; Dust collecting equipment; Other approved methods	A.A.C. R-18-2-702 A.A.C. R-18-2-726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2-702 A.A.C. R-18-2-727	This standard is applicable to any spray painting operation.
Demolition/renovation operations	N/A	A.A.C. R18-2-1101.A.8	This standard is applicable to any asbestos related demolition or renovation operations.

VII. MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS

A. Facility Wide

Along with the semiannual compliance certification, the Permittee is required to submit reports of all recordkeeping, monitoring and maintenance required by the permit.

B. Secondary Aluminum Processing Facility

1. The Permittee is required to prepare and implement a written Operation, Maintenance, and Monitoring (OM&M) plan submit the OM&M Plan to the Director within 90 days after a successful initial performance test.

2. The Permittee is required to operate a device to continuously monitor and record the temperature of the fabric filter inlet gases.

3. The Permittee is required to provide and maintain easily visible labels at each group 1 furnace and conduct inspections at least once per month to confirm that the labels are intact and legible.

4. The Permittee is required to operate and maintain a device that measures and records the feed/charge or throughput for each operating cycle or time period used

in the performance test. The Permittee may apply to the Administrator for an alternative monitoring method.

5. The Permittee is required to inspect each capture/collection and closed vent system at least once per calendar year.

6. The Permittee is required to calculate and record the 3-day, 24-hour rolling average emissions of D/F on a daily basis.

7. The Permittee is required to maintain records of the total charge weight or the total aluminum produced for each 24-hour period and calculations of 3-day, 24-hour rolling average emissions if the Permittee chooses to comply on the basis of aluminum production.

8. The Permittee is required to maintain files of all information required by the general provisions and 40 CFR 63.1517.

9. The Permittee is required to maintain each record for at least 5 years following the date of each occurrence, measurement, maintenance, corrective action, report or record.

10. The Permittee is required to keep records of alternate monitoring or test procedures (if applicable.)

11. The Permittee is required to keep current copies of the OM&M Plan and the site-specific secondary aluminum processing unit emission plan.

12. If the Permittee fails to meet an applicable standards, then the Permittee is required to keep the following records:

    a. Records of the emission unit ID, monitor ID, pollutant or parameter monitored, beginning date and time of the event, end date and time of the event, cause of the deviation or exceedance and corrective action taken.

    b. Records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

13. The Permittee is required to maintain records of monthly inspections for proper unit labeling for each affected source and emission unit subject to labeling requirements.

14. The Permittee is required to submit semiannual excess emissions and continuous monitoring system performance report and summary report.

15. The Permittee is required to submit a report if a malfunction occurred during the reporting period.

16. The Permittee is required to install, calibrate, maintain and operate a device for the continuous measurement of the pressure drop across the baghouse.

17. The Permittee is required to record the pressure drop across the baghouse once per day during normal operations.

18. If the pressure drop is outside the range recommended by the manufacturer, the Permittee is required to take corrective action to bring the parameter within the normal range.

19. The Permittee is required to inspect each feed hopper at least once each 8-hour period and record the results of each inspection. If lime is found not to be free-flowing during any of the 8-hour periods, the Permittee is required to inspect the lime hopper at least once every 4-hours for the next 3 days. The Permittee is required to maintain records of the inspections for each 8-hour period.

20. Once per month the Permittee is required to verify that the lime injection rate is no less than 90 percent of the lime injection rate used to demonstrate compliance during the most recent performance test.

21. The Permittee is required to install, calibrate, operate, and maintain a device to continuously measure and record the weight of gaseous or liquid reactive flux injected to each affected source or emission unit.

22. The Permittee is required to calculate and record the gaseous or liquid reactive flux injection rate (kg/Mg or lb/ton) for each operating cycle or time period used in the performance test.

23. The Permittee is required to maintain records of 15-minute block average inlet temperatures for each lime-injected fabric filter, including any period when the 3-hour block average temperature exceeds the compliant operating parameter value +14°C (+25°F), with a brief explanation of the cause of the excursion and the corrective action taken.

24. The Permittee is required to continuously measure and record the weight of gaseous or liquid reactive flux for each 15-minute period and calculate and record the total weight of gaseous flux for the 3 test runs.

C. Fugitive Dust

1. The Permittee is required to keep record of the dates and types of dust control measures employed.

2. The Permittee is required to show compliance with the opacity standards by having a Method 9 certified observer perform a monthly survey of visible emission from fugitive dust sources. The observer is required to conduct a 6-minute Method 9 observation if the results of the initial survey appear on an instantaneous basis to exceed the applicable standard.

3. The Permittee is required to keep records of the name of the observer, the time, date, and location of the observation and the results of all surveys and observations.

4. The Permittee is required to keep records of any corrective action taken to lower the opacity of any emission point and any excess emission reports.

D. Periodic Activities

1. The Permittee is required to record the date, duration and pollution control measures of any abrasive blasting project.

2. The Permittee is required to record the date, duration, quantity of paint used, any applicable MSDS, and pollution control measures of any spray painting project.

3. The Permittee is required to maintain records of all asbestos related demolition or renovation projects. The required records include the "NESHAP Notification for Renovation and Demolition Activities" form and all supporting documents.

VIII. TESTING REQUIREMENTS

A. Dioxins and Furans

1. The Permittee is required to conduct a Reference Method 23 performance test for D/F within 180 days of startup.

2. The Permittee is required to conduct subsequent performance tests for D/F within 23-25 months of the previous test.

B. Particulate Matter

1. The Permittee is required to conduct a Reference Method 5 performance test for particulate matter within 180 days of startup.

2. The Permittee is required to conduct subsequent performance tests for particulate matter within 23-25 months of the previous test.

IX. AMBIENT AIR IMPACT ANALYSIS

ADEQ performed dispersion modeling to determine whether the facility's emissions will interfere with attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) or not. ADEQ assessed six criteria pollutants including PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2 and Lead. Additionally, ADEQ performed dispersion modeling to estimate ambient the hazardous air pollutants (HAPs) concentrations and compared them against Arizona Ambient Air Quality Guidelines (AAAQG) for listed HAPs. AAAQGs are residential screening values that are protective of human health, including children. ADEQ assessed two HAPs, dioxin/furans (D/F) and Hydrogen Chloride (HCl).

ADEQ performed the ambient air impact analysis following the Environmental Protection Agency (EPA)'s Guideline on Air Quality Models (40 CFR Part 51 Appendix W) and ADEQ's Modeling Guidelines for Arizona Air Permits (hereafter "ADEQ Guidelines").

A. Model Selection

The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) model is the EPA-preferred model for estimating impacts at receptors located in simple terrain and complex terrain (within 50 km of a source) due to emissions from industrial sources. ADEQ used AERMOD for the ambient impact analysis.

The AERMOD Modeling System consists of three major components: AERMAP, used to process terrain data and develop elevations for receptors; AERMET, used to process the meteorological data; and AERMOD, used to estimate the ambient pollutant concentrations. ADEQ used AERMAP version 18081; AERMET version 18081; and AERMOD version 18081. These are the most recent versions of the AERMOD Modeling System.

B. Source Inputs

1. Sources of Emissions

The proposed Aluminum Manufacturing Facility processes scarp aluminum and produces aluminum products. The major processes include crushing and screening of scrap aluminum, aluminum melting and casting. The potential air pollutants from furnaces include particulate matters, CO, NOx, SO_2, VOCs, Lead, HCl, Dioxin and Furan. Additionally, fugitive emissions of particulate matters are generated due to trucks and loaders traveling on unpaved roads.

2. Modeled Emission Rates

Emissions for varied air pollutants were estimated based on the maximum short-term production rate of 10 tons aluminum per hour (240 tons of aluminum per day or 87,600 tons per year). Maximum hourly emission rates were modeled. For detailed emission calculations, please see the Application.

3. Source Configurations and Source Types

The emissions from furnaces are controlled by a baghouse with a capacity of 8,000 cubic feet per minute (CFM). ADEQ modeled the baghouse stack as a point source. ADEQ obtained the stack release parameters from the facility.

ADEQ characterized the emissions from roadways as a series of volume sources. The volume source parameters, including initial lateral dimension (σy_0), initial vertical dimension (σz_0) and release height, were estimated based on the horizontal and vertical dimensions of the volume source, following ADEQ Guidelines and the AERMOD User's Guide.

4. Building Downwash

ADEQ evaluated building downwash effects based on building and stack location and dimensions, and the EPA's Building Profile Input Program Plume Rise Model Enhancements (BPIP-PRME). ADEQ used multiple-tier technique to simulate the sloped roof structures of buildings.

5. Urban/rural Determination

The rural/urban classification of an area is determined either by the dominance of a specific land use or by population data in the study area. ADEQ determined the project site area as "Rural" based on the land use method.

6. Off-site (nearby) Sources

The EPA recommends that all nearby sources that are not adequately represented by background ambient monitoring data, should be explicitly modeled as part of the NAAQS analysis. To determine which nearby sources should be explicitly modeled in the air quality analysis, the EPA has established "a significant concentration gradient in the vicinity of the source under consideration" as the sole criterion for this determination. Since there are no off-site stationary sources that would cause a significant concentration gradient within the vicinity of the project site, no near-by sources were explicitly modeled. The impact from distant off-site sources are represented by background ambient monitoring data as discussed in **E**.

C. Meteorological Data

1. Meteorological Data Selection

For regulatory dispersion modeling analyses, 5 years of National Weather Service (NWS) station meteorological data, or at least 1 year of site-specific meteorological data, or at least 3 years of prognostic meteorological data should be used.

Since site-specific meteorological data are not available, ADEQ selected the most recent 5 years (2014-2018) of metrological data collected from the Aguila Meteorological Station (Aguila) in The Arizona Meteorological Network (AZMET). Aguila is located around 23 miles away from the project site. Due to their proximity, Aguila and the project site share the same climatic characteristics (desert climate). Aguila also has a similar surrounding topography to the project site. Moreover, the Aguila surface data meet the data completeness requirements of the EPA's Meteorological Monitoring Guidance for Regulatory Modeling Applications. Therefore, ADEQ determined that the Aguila data were representative of transport and dispersion conditions around the project site.

2. Meteorological Data Processing

ADEQ used the more recent version of AERMET meteorological preprocessor (v18081) to process five years of the Aguila surface data along with concurrent cloud cover data obtained from Blythe NWS station and upper air radiosonde data obtained from the Tucson NWS station. ADEQ also used the EPA's AERSURFACE tool (v13016) to calculate surface characteristic parameters (albedo, Bowen ration and surface roughness) required by AERMET.

D. Ambient Air Boundary and Receptor Network

ADEQ used the facility fenceline as the ambient air boundary. ADEQ set up a nested grid receptor network to determine areas of maximum predicted concentrations. A denser receptor grid with 25-meter spacing was placed closer to the sources, and a less dense grid (100 or 200-meter spacing) was further from the sources. The receptor network covered an area of 10 kilometer by 10 kilometer. ADEQ used the AERMAP terrain processor (v18081) to process the National Elevation Data (NED) data to generate the receptor elevations and hill heights.

E. Background Concentration

Typically, background concentrations should be determined based on the air quality data collected in the vicinity of the proposed project site. However, if there are no monitors located in the vicinity of the project, a "regional site" may be used to determine background concentrations. There are no monitoring sites in the immediate vicinity of the Alliance project site. Therefore, a "regional site" must be selected to determine the background concentration based on similar/representative source impacts.

ADEQ selected the Alamo Lake site as a representative site for PM_{10} and $PM_{2.5}$, mainly because the Alamo Lake site is the only active monitoring site for the two pollutants in La Paz County. There are no any active monitoring sites for NO_2, SO_2, CO and Lead in La Paz County. Therefore, ADEQ selected the JLG supersite in Phoenix to determine the background concentrations for these pollutants. This method was conservative and acceptable.

F. One –Hour NO_2 Modeling Methodology

The EPA recommends three-tiered approach for 1-hour NO_2 modeling. ADEQ used the most conservative approach - Tier 1 assuming full conversion of NO to NO_2.

G. Model Results

Table 3 summaries the modeled results for criterial pollutant. Representative or conservative background concentrations were added to modeled impacts and the total concentrations were then compared to the NAAQS. As shown in Table 3, emissions from the Alliance Metals project will not cause or contribute to a violation of the NAAQS under the operational limits/conditions as proposed in the draft permit. The AERMOD modeling analysis also revealed that the modeled design concentrations occurred within or near the facility fenceline.

Table 3 Modeled Results for Criterial Pollutants

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Maximum Ambient Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
PM_{10}	24-hour	27.0	74.0	101.0	150
$PM_{2.5}$	24-hour	4.6	9.2	13.8	35
	Annual	1.4	3.3	4.7	12
NO_2	1-hour	16.7	95.9	112.6	188
	Annual	0.52	26.8	27.3	100
CO	1-hour	33.1	2,593	2,626	40,000
	8-hour	14.2	2,150	2,164	10,000
SO_2	1-hour	0.2	14.8	15.0	196
Lead	Rolling 3 month average	0.00001	0.01	0.01	0.15

Table 4 summaries the modeled results for HAPs. Doxins and furans include 210 different toxic substances. The one considered most toxic is referred to as 2,3,7,8-tetrachlorodibenzo-p-dioxin, or simply TCDD. Therefore, ADEQ compared the modeled concentrations to the AAQG for 2,3,7,8-TCDD. As shown in Table 4, the modeled concentrations for HAPs are well below the AAAQG.

Table 4 Modeled Results for HAPs

HAPs	Averaging Period	Modeled Concentration (µg/m3)	AAAQG (µg/m3)
D/F	1-hour	4.01E-06	4.20E-02
	24-hour	9.11E-07	1.10E-02
	Annual	1.06E-07	2.40E-05
HCL	1-hour	5.35	216
	24-hour	1.21	56
	Annual	0.14	7

X. LIST OF ABBREVIATIONS

AAAQG. ..... Arizona Ambient Air Quality Guidelines
AAB ..... Ambient Air Boundary
A.A.C. ..... Arizona Administrative Code
ADEQ ..... Arizona Department of Environmental Quality
AERMAP ..... Terrain data preprocessor for AERMOD
AERMET ..... Meterological data preprocessor for AERMOD
AERMOD ..... American Meteorologica Society/EPA Regulatory Model
AERSURFACE ..... Surface characteristics tool for use in AERMET
AZMET ..... Arizona Meteorological Network
BACT ..... Best Available Control Technology
BPIP ..... Building Profile Input Program
Btu/ft^3 ..... British Thermal Units per Cubic Foot
Btu/hr ..... British Thermal Units per Hour
CFR ..... Code of Federal Regulations
CFM ..... Cubic Feet Per Minute
CO ..... Carbon Monoxide
D/F ..... Dioxins and Furans
EPA ..... Environmental Protection Agency
FERC ..... Federal Energy Regulatory Commissions
HAP ..... Hazardous Air Pollutant
HCl ..... Hydrogen Chloride
hp ..... Horsepower
LAER ..... Lowest Achievable Emission Rate
lb/hr ..... Pound per Hour
NAAQS ..... National Ambient Air Quality Standards
NED ..... National Elevation Dataset
NESHAP ..... National Emission Standards for Hazardous Air Pollutants
NO_x ..... Nitrogen Oxides
NSR ..... New Source Review
NWS ..... National Weather Service
Pb ..... Lead
PM ..... Particulate Matter
PM_{10} ..... Particulate Matter Nominally less than 10 Micrometers
$PM_{2.5}$ ..... Particulate Matter Nominally less than 2.5 Micrometers
PRIME ..... Plume Rise Model Enhancements
RBLC ..... RACT/BACT/LAER Clearinghouse
SO_2 ..... Sulfur Dioxide
SO_x ..... Sulfur Oxides
VOC ..... Volatile Organic Compound